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Utz, S.; Ouwerkerk, J.W.; van Lange, P.A.M.

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What is smart in a social dilemma? Differential effects of priming competence on cooperation

SONJA UTZ*, JAAP W. OUWERKERK AND PAUL A. M. VAN LANGE
Free University Amsterdam, The Netherlands

Abstract

Prior theorizing of rationality in social dilemmas suggests that individuals pursuing different interaction goals may 'perceive' different associations between competence and behaviour in a social dilemma, arguing that competitive individuals associate competence with noncooperation (i.e. noncooperation = smart), whereas prosocial individuals associate competence with cooperation (i.e. cooperation = smart; goal-prescribes-rationality principle, Van Lange & Kuhlman, 1994). The present research examines whether cooperative interaction can be affected by subtle activation (or priming) of competence, and whether the effects may differ for competitive versus prosocial participants. Consistent with hypotheses, two experiments revealed that priming competence yielded reduced levels of cooperation (and greater exploitation) among competitors, and yielded no effects (Experiment 1) or a tendency towards enhanced cooperation (Experiment 2) among prosocials. The discussion considers theoretical implications of relatively subtle influences on cooperative interaction in social dilemmas. Copyright © 2004 John Wiley & Sons, Ltd.

Research on cooperation in social dilemmas has tended to focus on rather explicit interventions, such as changing the payoff structure of the social dilemma, introducing sanction systems, establishing a leader or facilitating communication (Komorita & Parks, 1995; Messick & Brewer, 1983). Complementary approaches emphasize the importance of individual difference variables, such as differences in prosocial, individualistic, and competitive orientations (i.e. social value orientation; Kuhlman & Marshello, 1975; McClintock, 1978; McClintock & Liebrand, 1988; McClintock, Messick, Kuhlman, & Campos, 1973; Van Lange, Otten, De Bruin, & Joireman, 1997). And more recently, researchers have begun to explore the effects of framing on cooperation and competition (e.g. Van Dijk & Wilke, 2000). Despite these latter efforts, it is fair to say that the extant literature has focused primarily on relatively explicit influences on cooperation in social dilemmas, thereby overlooking the potential ability of relatively subtle influences to affect cooperative interaction in social dilemmas.

*Correspondence to: Dr Sonja Utz, Department of Communication Science, Free University of Amsterdam, De Boelelaan 1081, 1081 HV Amsterdam, The Netherlands. E-mail: s.utz@fsw.vu.nl

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The present research examines whether *priming* competence, thereby using a relatively subtle manipulation, may affect cooperation in a social dilemma, and whether the effects of priming competence may enhance cooperation, diminish cooperation, or yield no effects depending on whether an individual holds a prosocial, a competitive, or an individualistic orientation. Specifically, on the basis of the so-called goal-prescribes-rationality principle (Van Lange & Kuhlman, 1994; Van Lange & Liebrand, 1991), we assume that in the context of social dilemmas, some individuals are likely to associate competence with cooperation (i.e. cooperation = smart), whereas other individuals are more likely to associate competence with noncooperation and even exploitation (i.e. noncooperation = smart).

Priming, or the implicit activation of some stored knowledge and its influence on social perception, is a prominent topic in social psychology since the seminal study by Higgins, Rholes, and Jones (1977). In recent years, the effects of priming on *behaviour* have received more attention (Bargh, Chen, & Burrows, 1996; Chen & Bargh, 1997; Dijksterhuis et al., 1998; Dijksterhuis & Van Knippenberg, 1998; cf. Dijksterhuis & Bargh, 2001). For example, people walk slower when primed with the stereotype of the elderly and perform better on a knowledge test when primed with the category of professors (Bargh et al., 1996; Dijksterhuis et al., 1998).

There are also studies examining the influences of priming on cooperation in a social dilemma. For example, lower levels of cooperation have been reported for individuals primed with aggression or competition (Herr, 1986; Neuberg, 1988). Hertel and Fiedler (1994) found higher levels of cooperation after a morality prime than after a power prime. Several recent studies build on this study and extend the findings. One interesting study by Hertel and Fiedler (1998), using an allocation task, revealed that only participants without a stable social value orientation are sensitive to priming influences. This finding suggests that the behaviour of only those who have not developed 'strong' orientations may be influenced by relatively subtle mechanisms. Finally, a recent study replicated and extended the previous work by Hertel and Fiedler (1994, 1998) by demonstrating that priming morality enhanced cooperation, except for participants with relatively strong proself orientations (Smeesters, Warlop, Van Avermaet, Corneille, & Yzerbyt, 2003). For these individuals, cooperation in the morality priming condition was lower than in the neutral priming condition. They expected high cooperation from the interaction partner when primed with morality, but tried subsequently to exploit their partner. Taken together, there is some evidence that priming may influence cooperative behaviour, and the effects may be observed for only a particular group of social value orientation.

The present research extends previous research on priming effects on cooperation in a social dilemma in two important ways. *First*, most or all previous research has examined either behaviour in a single trial, or behaviour in multiple trials but without receiving information about the other's behaviour after each trial (e.g. Hertel & Fiedler, 1998; Neuberg, 1988; Smeesters et al., 2003). The present research extends this research by examining the effects of priming in *ongoing interpersonal interactions*, more precisely, cooperation in several rounds of a social dilemma whereby participants receive trial-by-trial information about the other's behaviour. This is an important extension because behaviour in repeated interactions is shaped by additional influence factors. Strategic considerations such as reciprocity play a role. In a one-shot dilemma, defection is the dominant strategy. In repeated interactions, the partner can punish noncooperative behaviour, and it pays off more to be cooperative.

Second, most previous research has examined the priming of concepts that are directly linked to cooperation and competition (e.g. aggression, competitiveness, Herr, 1986; Neuberg, 1988), rather than concepts that have been demonstrated to be central to person impressions. The dimension of competence (i.e. intellectual desirability, ability) appears to be a dimension that individuals tend to use in organizing and forming person impressions (Rosenberg & Sedlak, 1972; see also Reeder & Brewer, 1979; Skowronski & Carlston, 1989). Moreover, as noted earlier, based on the goal-prescribes-rationality principle, we hypothesized differential effects for individuals with prosocial,

individualistic, and competitive orientations—depending on whether individuals associate competence with cooperation or noncooperation.

THE GOAL-PRESCRIBES-RATIONALITY PRINCIPLE

Social value orientations are defined as relatively stable preferences for certain distributions of outcomes between self and other (Messick & McClintock, 1968; Van Lange, Otten et al., 1997). Mostly, three social value orientations are distinguished (according to their goal): prosocials (maximizing joint outcome and maximizing equality in outcomes), individualists (maximizing own outcome), and competitors (maximizing difference between own and other's outcome).

There is a good deal of evidence indicating that individualists and competitors behave less cooperatively in social dilemmas and related interdependent situations than do prosocials (Kramer, McClintock, & Messick, 1986; Kuhlman & Marshello, 1975; Liebrand & Van Run, 1985; McClintock & Allison, 1989; McClintock & Liebrand, 1988; Van Lange, Agnew, Harinck, & Steemers, 1997; Van Vugt, Van Lange, & Meertens, 1996). Moreover, prosocials, individualists, and competitors do not only differ in their *behaviour towards*, but also in their *perception of* interaction partners. For example, Liebrand, Jansen, Rijken, and Suhre (1986) found that in rating cooperative and noncooperative partners, prosocials, individualists, and competitors use different dimensions. Specifically, prosocials tend to view cooperative partners as more honest and fairer than noncooperative partners, hence emphasizing differences in morality. Individualists and competitors tend to view cooperative partners as weaker and less competent than noncooperative partners, hence emphasizing differences in might and competence.

These effects have been demonstrated in several experiments, including paradigms in which participants infer expectations regarding the partner's behaviour on the basis of morality and competence information (Sattler & Kerr, 1991; Van Lange & Kuhlman, 1994). This research has revealed that prosocials, individualists, and competitors expect greater cooperation from others believed to be honest and fair than from others believed to be rather dishonest and unfair. In contrast, the dimension of competence has yielded different effects. Specifically, prosocials tend to expect greater cooperation from others believed to be intelligent and competent, whereas individualists and competitors expect greater cooperation from others believed to be unintelligent and incompetent (Van Lange & Kuhlman, 1994).

These latter findings can be explained by the *goal-prescribes-rationality* principle (Van Lange & Kuhlman, 1994; Van Lange & Liebrand, 1991). This principle builds on the definition of social dilemmas as a conflict between individual rationality and collective rationality (see Pruitt & Kimmel, 1977). Individual rationality prescribes noncooperative behaviour, because for each independent interaction, an individual is better off by enacting noncooperative behaviour irrespective of the partner's behaviour. Collective rationality prescribes cooperative behaviour, because for each independent interaction, the two individuals are better off by jointly enacting cooperative behaviour rather than by jointly enacting noncooperative behaviour.

The goal-prescribes-rationality principle further assumes that individuals with prosocial orientations are likely to adopt the perspective of collective rationality in social dilemmas because they are oriented toward enhancing joint outcomes and equality in outcomes. In contrast, individualists and competitors are assumed to adopt the perspective of individual rationality, at least in social dilemmas in which behaviour is not shaped by acting and reacting to one another's behaviours—such as in the single-trial social dilemma, or in social dilemmas with repeated behaviour but without trial-by-trial information about one another's behaviours.

However, in the context of social dilemmas in which participants are informed about one another's behaviour, individualists may differ from competitors. Specifically, individualists sometimes tend to enact high levels of cooperation in such social dilemmas, because they realize that cooperative behaviour can be an effective means toward the goal of enhancing own outcomes (e.g. Kuhlman & Marshello, 1975; Van Lange & Visser, 1999). This effect does not appear to be invariable across several contexts (e.g. sometimes individualists persist in relatively low levels of cooperation in such dilemmas; Parks & Rumble, 2001). Competitors, on the other hand, appear to be 'more predictable', in that several studies, using different contexts, reveal that competitors exhibit low levels of cooperation. In fact, we do not know of any study revealing that competitors exhibit very high levels of cooperation in social dilemmas characterized by repeated interaction and trial-by-trial information (although there is evidence suggesting that their levels of cooperation can be promoted to moderate levels; see Sheldon, 1999). These findings make sense if one realizes that competitors are primarily oriented toward obtaining greater outcomes than the partner. Thus, competitors should adopt the perspective of individual rationality to such social dilemmas.

Taken together, we assumed that the priming of competence activates the association between competence and cooperation among prosocials, and activates the association between competence and noncooperation among competitors. Hence, we predicted that relative to a neutral prime condition, priming competence would enhance cooperative interaction in prosocials, and reduce cooperation in competitors. Indeed, for competitors, we anticipated that priming competence would enhance tendencies toward exploitation in an effort to 'outperform' the partner. Finally, for individualists, we assumed that priming competence could yield positive effects, negative effects, or no effects at all; hence, we advanced no a priori prediction for individualists.

EXPERIMENT 1

The major purpose of Experiment 1 is to test two specific hypotheses, derived from the goal-prescribes-rationality principle, predicting that priming competence should enhance cooperation in prosocials, and reduce cooperation (i.e. enhance tendencies toward exploitation) in competitors. These predictions were tested using a give-some dilemma in which participants received trial-by-trial information about one another's behaviour (i.e. the number of coins the partner gave away). Also, the paradigm involved a fictitious other person, who was preprogrammed to enact moderate levels of cooperation (i.e. giving away on average two of four coins across all interaction trials).

Finally, and of lesser relevance, we varied perceptions regarding a partner's similarity to self, as we wished to explore whether perceived similarity may illuminate the effects of priming competence among prosocials and competitors. We reasoned that perceived similarity might strengthen the effects of priming competence for prosocials in particular, because they are assumed to associate cooperation with competence when the other can also be expected to enact high levels of cooperation.

Method

Participants and Design

Ninety-three students (28 men, 65 women) of the Free University Amsterdam participated in the experiment. Participants were paid Dfl 10 (which equals about $4 in American currency) as compensation. The study involved three between-participant variables and one within-participant

variable. The between-participant variables were social value orientation (prosocial vs. individualistic vs. competitive), priming (neutral vs. competence), and alleged similarity of the interaction partner (low vs. high). The within-subject variable was block of trials.

Procedure

Participants were recruited at different locations at the Free University campus for a study on decision making, and scheduled in groups of up to 13 participants. Upon arrival in the laboratory, participants were seated in individual cubicles equipped with a computer. All parts of the experiment were presented on the computer terminal. Participants were told that they participated in several unrelated experiments which were combined for reasons of efficiency.

Decomposed Games

Participants' social value orientation was assessed using the Triple Dominance Measure of Social Values (Van Lange, Otten et al., 1997). In these decomposed games, people have to make nine times a choice between three different distributions of outcomes between themselves and an unknown other. For example, they can choose between option A (500 points for the participant and 500 points for the other), option B (540 points for the participants, 280 points for the other), and option C (480 points for the participant, 100 points for the other). In this example, A is the prosocial choice, because joint outcome is higher than in option B or C. Option B represents the individualistic choice, because own outcome is highest in this option. Option C is the competitive choice because it maximizes the difference between own and other's outcome. Participants are classified if they make six or more choices consistent with one of the three social value orientations. Twenty-eight participants were classified as prosocials, 26 as individualists, and 24 as competitors.

After completing the decomposed games, participants had to answer 30 personality questions. These questions were presented as a second, unrelated study, but were actually used to set up the similarity manipulation and to reduce the time between priming and actual playing of the dilemma (see below). The questions were unrelated to competence or morality (e.g. 'I laugh out loud' or 'I like to be alone').

Give-some Dilemma

After completing the personality questions, the explanation of the give-some dilemma was presented. A four-coin give-some dilemma consisting of 20 trials was used (Van Lange & Kuhlman, 1994). The participant and the interaction partner were seated round a virtual table, and the implementation of the decisions was displayed by animated graphics. At beginning of each trial, the participant had four green coins in his/her cash-box on the computer screen. The interaction partner had four blue coins. Each own green coin had a value of Dfl 1 to the person his/herself, but a value of Dfl 2 to the interaction partner. Similarly, each blue coin had a value of Dfl 1 to the interaction partner, but a value of Dfl 2 to the participant. The participant's task was to decide how many of his or her four green coins he or she would give to the interaction partner (0, 1, 2, 3, or 4). At the same time, the interaction partner—in the present study, in fact the computer—was supposed to make a decision about how many of his or her blue coins he or she would give to the participant (0, 1, 2, 3, or 4). Thus, the outcome was determined by the choices of *both* partners. The possible outcomes were presented in a 5×5-payoff matrix to the

participants on a sheet of paper lying next to the computer. After the explanation of the dilemma, participants answered ten questions to check their comprehension of the give-some dilemma. Two participants were later excluded from the analysis because they answered only four questions correctly.

The outcome of the interactions was presented in Dutch guilders. Participants were told that the amount of money was hypothetical, but that they could improve their chances of winning an extra bonus of Dfl 25, by earning more 'money'. Thus, although hypothetical, the amount of money earned was relevant to participants (for an identical procedure, see Van Lange & Visser, 1999). (In the actual raffle, held after the experiment was completed, each participant had an equal chance of winning one of the bonuses.)

Manipulation of Similarity

Participants were informed that they would be paired now with a (not very) similar other to do the dilemma task in the (low) high similarity condition. The selection of the interaction partner was said to be based on the personality questions completed earlier. The computer then ostensibly started to connect the participant to the central server to select a (not very) similar interaction partner. Instead of a success message, a problem message occurred on the screen. Participants were informed that not all participants had completed all the questionnaires and instructions, and that they would therefore first complete another, small study. This study was presented as a test of verbal skills, but was in fact the priming manipulation. The cover story was used to reduce the delay between priming and doing the dilemma task to exclude the possibility that the detailed explanation of the dilemma dilutes the priming effect. At the same time, this procedure produced a delay of about 10 min between completion of the decomposed games and the priming manipulation.

Priming

Participants had to unscramble 16 scrambled sentences. Each scrambled sentence consisted of five words. Four of them should be used to make a grammatically correct sentence. Ten sentences were primes. Selection of the prime words was based on a pretest, in which 50 words were judged with regard to their relatedness to competence and morality. Twenty-eight pretest-participants rated the relatedness of the words to competence, 29 pretest-participants rated the relatedness to morality to exclude the possibility that effects were caused by unintended morality primes. Ratings were made on 7-point scales. The ten selected competence primes scored significantly above the midpoint of the competence-relatedness-scale, but were also judged as *not* to be related to morality. The neutral primes were neither related to competence nor to morality. The six filler primes were taken from another study (Walther, Dambacher, Dias, & Reich, 2000). An example for a competence prime is: *talented is she musician the* which could be solved as *the musician is talented*. The prime word in this example is *talented*. The primes were in Dutch, but a close translation of the other nine primes is *intelligent*, *competent*, *clever*, *gifted*, *smart*, *capable*, *businesslike*, *ambitious*, and *experienced* (see Appendix for the Dutch competence primes and their English translation).

Preprogrammed Cooperation in the Dilemma

The mean level of cooperation of the alleged interaction partner was giving two coins. Two blocks of ten trials, thus 20 trials in total, were played. Within each block of ten trials, a normal distribution of

answers was programmed: Participants received four times two coins, two times one or three coin(s) and one time zero or four coins in each block. Cooperation in the first and tenth trial was always two coins; cooperation in the remaining eight trials was randomized. The cooperation of the computer was therefore independent from actual cooperation of the participant, it did not reciprocate the behaviour of the participant. A non-reciprocal strategy was chosen for two reasons. First, it allows attributing differences between conditions in mean cooperation to the priming manipulation or social value orientation. The alternative explanation that differences are due to characteristics of the specific interaction can be excluded, when this factor is held constant. Second, we want to test whether competitive participants exploit the other, i.e. take advantage of the cooperation of the other, when primed with competence. A strictly reciprocal strategy as for example tit-for-tat is more difficult to exploit.

Post-experimental Questionnaire

To check whether participants were aware of the priming manipulation they were asked what they thought was the goal of the studies and whether they thought that their decisions in the dilemma game were influenced by one of the other tasks. One participant reported to be influenced by the priming task. Although she did not correctly guess the goal of the study, the data of this participant were excluded from further analyses. In addition, a check for the similarity manipulation was included. Participants had to indicate on a 7-point scale their agreement with the statement 'I think, I have many things in common with the other person'. At the end, demographics of the participants were assessed. After completing the experiment, participants were paid, debriefed, and dismissed.

Results

Manipulation Check

A 3 (social value orientation: prosocial vs. individualistic vs. competitive) $\times$ 2 (priming: neutral vs. competence) $\times$ 2 (similarity: high vs. low) univariate analysis of variance on the manipulation check item revealed a significant main effect of similarity, $F(1,\ 66) = 5.72,\ p < 0.05$. As expected, participants in the high similarity condition thought they had more in common with the interaction partner ($M = 4.04$) than the ones in the low similarity condition ($M = 3.52$). No other main effects or interactions were significant, all Fs < 2.11, *ns*.

Mean Cooperation

Cooperation was analysed in two blocks of ten trials. The 3 (social value orientation: prosocial vs. individualistic vs. competitive) by 2 (priming: neutral vs. competence) by 2 (similarity: high vs. low) by 2 (block) analysis of variance with repeated measures on the last factor yielded a significant main effect of social value orientation, $F(2,\ 66) = 13.52,\ p < 0.001$. As would be expected, prosocials exhibited greater levels of cooperation ($M = 2.01$) than did individualists ($M = 1.60$) and in turn competitors ($M = 1.12$). All three groups differed significantly from each other (ps < 0.05; Bonferroni). All other main effects were not significant, Fs < 3.27.

However, as predicted, the interaction between priming and social value orientation was significant, $F(2, 66) = 3.71$, $p < 0.05$. Tests for simple main effects revealed that the priming manipulation only affected competitors, $F(1, 66) = 8.57$, $p < 0.01$, but not prosocials or individualists, both Fs < 1, *ns*. As

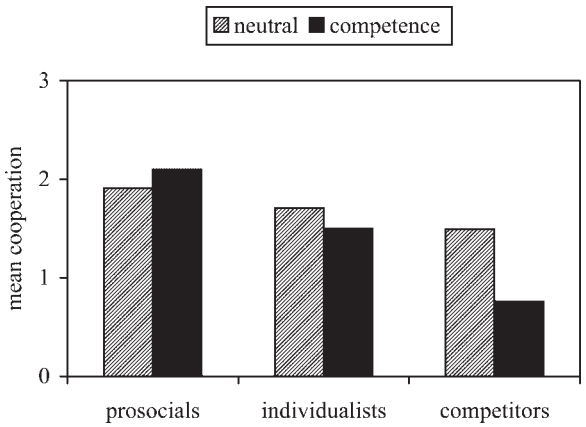

Figure 1. Mean cooperation as a function of social value orientation and priming (Experiment 1)

can be seen in Figure 1, competitive participants exhibited significantly lower levels of cooperation when primed with competence ($M = 0.76$) than in the neutral condition ($M = 1.49$). The effect of priming competence was not significant for prosocials, even though means were in the predicted direction ($M = 2.10$ vs. $M = 1.91$ for competence vs. neutral condition). And finally, priming competence also did not cause significant effects in individualists ($M = 1.50$ vs. $M = 1.71$ for competence vs. neutral condition). No other interactions were significant, all Fs < 1, *ns*. The absence of interaction effects involving the block variable indicates that the effects are stable over 20 trials.

Discussion

Experiment 1 revealed partial support for our main hypotheses. Specifically, as predicted, priming competence caused competitors to exhibit lower levels of cooperation, and stronger tendencies toward exploitation of the other. We did not obtain support for the prediction that priming competence causes prosocials to exhibit significantly greater levels of cooperation, even though the pattern of means was in the predicted direction. The former finding is of great theoretical interest, because it provides preliminary evidence for the notion that (a) the association that competitors view between noncooperation and competence can be subtly but effectively activated, and (b) such activation through priming can cause relatively enduring effects, shaping patterns of interactions in settings of interdependence.

As noted earlier, priming competence did not significantly increase cooperation among prosocials. However, a closer look at the data suggest that prosocials behaved as 'collectively rationally' as possible, at least in light of the two primary goals that prosocials pursue: enhancing joint outcomes and enhancing equality in outcomes (Van Lange, 2000). Although the dominant reaction of prosocials is cooperation, it is also known that they do not want to be exploited and behave competitively if the interaction partner does not cooperate (behavioural assimilation; Kelley & Stahelski, 1970). Recall that mean cooperation of the interaction partner was exactly two coins. In the neutral prime condition, prosocials exhibited a mean level of cooperation that was very close to two coins ($M = 1.91$), thereby enhancing joint outcomes while ensuring a nearly perfect equality in outcomes. By priming competence, prosocials were facing a psychological ceiling, in that they should not go far beyond the two coin limit, if they indeed want to ensure equality in outcomes and avoid being exploited. Indeed, they did not ($M = 2.10$). Thus, the absence of effects of priming competence can be understood by the 'limits' dictated by the goals of enhancing equality in outcomes and avoiding exploitation.

EXPERIMENT 2

The main goal of Experiment 2 was to examine the effect of priming competence among prosocials and competitors, thereby seeking to extend and complement Experiment 1 in at least two respects. First, rather than manipulating varying levels of perceived similarity, Experiment 2 directly manipulated the partner's strategy. This allows us to examine more directly whether the effects of priming competence for prosocials depend on the level of cooperation exhibited by the partner. As for Experiment 1, we reasoned that a high level of cooperation by the partner might strengthen the effects of priming competence for prosocials in particular, because they are assumed to associate cooperation with competence when the other can also be expected to enact high levels of cooperation. Second, and more minor, Experiment 2 extended the number of trials from 20 to 32, allowing us to examine whether priming effects can still be observed over an even more extended series of interactions.

The main hypothesis is that priming competences should (a) promote cooperation in prosocials, and (b) reduce cooperation (while enhancing exploitation) in competitors. Of lesser relevance, we predict that prosocials should be more responsive to variations in their partner's level of cooperation (i.e. cooperating with a cooperative partner, and not cooperating with a noncooperative partner) than competitors who 'always' tend to exhibit low levels of cooperation. This pattern is consistent with some previous research (e.g. Kelley & Stahelski, 1970; Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988), as well as with our earlier-noted argument that prosocials seek to enhance joint outcomes and equality in outcomes.

Method

Participants and Design

Participants were 134 students (31 men, 103 women) of the Free University Amsterdam. Participants received Dfl 10 as compensation. The study had a 3 (social value orientation: prosocial vs. individualistic vs. competitive) $\times$ 2 (priming: neutral vs. competence) $\times$ 2 (strategy: noncooperative vs. cooperative) between-participants design.

Procedure

The procedure was almost identical to the one used in Experiment 1. Only the number of trials was increased to 32 trials to further examine the longevity of priming effects. Social value orientation of the participants was assessed again by using the Triple Dominance Measure of Social Values (Van Lange, Otten et al., 1997). Fifty-two participants were classified as prosocials, 36 as individualists and 25 as competitors. Twenty-one participants could not be classified because they did not make six or more consistent choices.

Strategy

Instead of alleged similarity, actual behaviour of the interaction partner, in fact a preprogrammed strategy, was varied. The noncooperative strategy displayed a mean level of cooperation of giving one coin to the participant, whereas the cooperative strategy displayed a mean level of cooperation of

giving three coins to the participant. Eight blocks of four trials were programmed. Within these four trials, a normal distribution of answers with a mean of standard deviation of 1 was programmed (noncooperative: 0, 1, 1, 2 coins; cooperative: 2, 3, 3, 4). The order in which these answers occurred was randomized within the blocks, with the exception that cooperation in the first and last of the 32 trials was always one (three) in the noncooperative (cooperative) strategy condition.

Post-experimental Questionnaire

After the experiment, the same checks concerning participants' awareness of the priming manipulation as in Experiment 1 were administered. One participant felt influenced by the priming task, although she could not specify in what way. The data of this participant were excluded from further analyses. At the end, demographics of the participants were assessed. After completing the experiment, participants were paid, debriefed, and dismissed.

Results

Mean Cooperation

To test our hypotheses, we conducted a 3 (social value orientation: prosocial vs. individualistic vs. competitive) by 2 (priming: neutral vs. competence) by 2 (strategy: noncooperative vs. cooperative) analysis of variance on cooperation. Blocks was dropped as a variable because there were no effects in Experiment 1. This analysis revealed, as might be expected, a main effect of social value orientation, $F(2, 101) = 5.88$, $p < 0.01$. Alpha protected pairwise comparions (Bonferroni) indicated that prosocials ($M = 1.71$) and individualists ($M = 1.64$) exhibited greater levels of cooperation than did competitors ($M = 1.21$), ps < 0.05. A main effect of strategy, $F(1, 101) = 80.69$, $p < 0.001$, showed that a cooperative interaction partner elicited greater levels of cooperation ($M = 2.05$) than did a noncooperative interaction partner ($M = 0.98$).

More importantly, the analysis revealed an interaction between priming and social value orientation, $F(2, 101) = 6.31$, $p < 0.01$. Tests of simple main effects revealed that, relative to the neutral condition, priming competence reduced the level of cooperation for competitors (Ms $= 1.57$ and 0.85), $F(1, 100) = 9.38$, $p < 0.01$, caused a tendency towards greater cooperation for prosocials (Ms $= 1.57$ and 1.85), $F(1, 101) = 2.81$, $p < 0.10$, and exerted no effect on cooperation for individualists (Ms 1.52 and 1.75), $F(1, 101) = 1.35$, *ns*. These findings are consistent with the hypotheses, although the effects for prosocials are only marginal.

There was also an interaction between strategy and social value orientation, $F(2, 101) = 3.34$, $p < 0.05$, indicating that the effect of strategy was stronger for prosocials, $F(1, 101) = 67.77$, $p < 0.001$ ($M_{non} = 1.02$, $M_{coop} = 2.39$, $M_{diff} = 1.37$) and individualists, $F(1, 101) = 36.95$, $p < 0.001$ ($M_{non} = 1.02$, $M_{coop} = 2.25$, $M_{diff} = 1.23$) than for competitors, $F(1, 101) = 6.37$, $p < 0.001$ ($M_{non} = 0.90$, $M_{coop} = 1.52$, $M_{diff} = 0.62$). This is consistent with our reasoning as well as with previous research, revealing that prosocials and individualists respond more strongly to the behaviour of the interaction partner in social dilemmas than do competitors (Kelley & Stahelski, 1970; Van Lange & Visser, 1999). No other interaction effects were significant, all Fs < 1.54, *ns*.

Although the three-way interaction between priming, social value orientation and strategy was not significant, $F(2, 101) = 1.54$, $p = 0.22$, it is of some interest to note that priming competence exerted virtually no effect on prosocials' behaviour when the interaction partner was noncooperative (Ms $=$ 1.03 and 1.02 respectively), $F < 1$, *ns* (see Figure 2, left panel). In contrast, prosocials cooperated

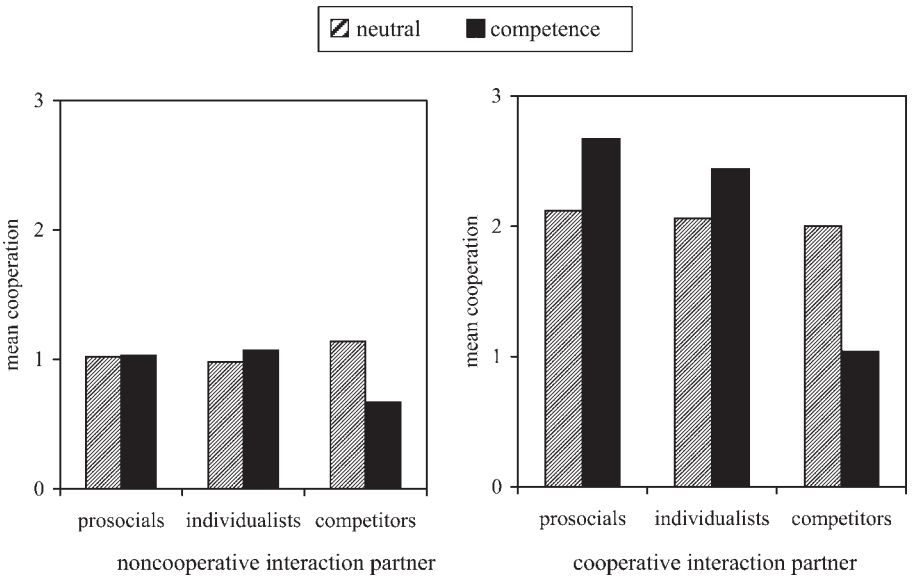

Figure 2. Mean cooperation as a function of social value orientation, cooperation of the interaction partner, and priming (Experiment 2)

significantly more after a competence prime ($M = 2.67$) than in the neutral condition ($M = 2.12$) when the interaction partner was cooperative, $F(1, 112) = 5.45$, $p < 0.05$ (Figure 2, right panel).

Discussion

Complementing the findings of Experiment 1, Experiment 2 revealed, as predicted, that priming competence exerted detrimental effects on cooperative interaction among competitors. Also, Experiment 2 revealed a tendency towards enhanced cooperative interaction after priming prosocials with competence. Again, no significant effect was obtained for individualists.[1] Additionally, Experiment 2 also revealed that relative to individualists and competitors, prosocials were more responsive to the strategy pursued by the partner, responding cooperatively to a cooperative other and noncooperatively to a noncooperative partner.

GENERAL DISCUSSION

Two experiments revealed that cooperative interaction in a social dilemma can be influenced by a relatively subtle manipulation such as priming competence, at least for interactions involving a person

[1]To examine whether cooperation levels shifted indeed because of a tendency to behave more competitively (competitors) respectively more cooperatively, (prosocials) and not because of a 'I don't care' attitude in which choices become simply more random—a possibility suggested by one of the reviewers—we also had a look at the distributions. For prosocials and individualists, the distributions are only shifted in the respective direction. However, competitors showed a different pattern—the distributions were heavily skewed in the competence priming conditions. In Experiment 1 (20 trials) they made on average five zero-coin choices in the neutral condition, but 11 in the competence priming condition. In Experiment 2 (32 trials) the same pattern emerged: 9 vs. 16 competitive choices. Thus, the changes in cooperation levels are indeed systematic and not based on more random choices.

who is inclined to pursue competitive interaction goals. While the predicted 'harmful effects' of priming competence for competitors received good support, the predicted 'beneficial effects' of priming competence for prosocials received weaker support. In the following, we briefly consider the purposes of this research, and outline the meaning and implications of the findings.

To begin with, the goal-prescribes-rationality principle (Van Lange & Kuhlman, 1994; Van Lange & Liebrand, 1991) offered the theoretical and empirical basis for hypothesizing different associations between competence and cooperation for competitors and prosocials. For the present social dilemma task, we assumed that competitors would adopt an individual rationality perspective to cooperation, viewing a positive association between competence and noncooperation. Based on this reasoning, we predicted and found that priming competence yielded lower levels of cooperation among competitors.

This finding has at least two important implications. First, given the subtle or implicit nature of the activation of competence, the present findings suggest that 'it may take very little' to strengthen tendencies toward exploitation among competitors even further. Frequently, it is assumed that competitors' behaviour is relatively constant in a social dilemma ('they simply do not cooperate, irrespective of . . . '); for example, competitors are not even responsive to tit-for-tat so that they evidence greater cooperation (see Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988). However, the present findings suggest that competitors may respond to contextual differences, even small ones. At the same time, the contextual manipulation was one that justifies competition and exploitation for individuals thinking in terms of individual rationality, and it remains to be seen in future research whether competitors would also be affected by contextual manipulations that 'prescribe' enhanced cooperation—not enhanced exploitation (e.g. priming morality or prosocial concerns). The results of Smeesters et al. (2003) for one-shot dilemmas indicate that it is much more difficult to induce cooperation in highly consistent proselfs than to induce enhanced competition.

Second, from a more practical point of view, the present findings indicate that one should be careful in activating competence with competitors. It is one thing to know that people walk more slowly after being primed with words associated with the elderly (Bargh et al., 1996), it is quite another thing being interdependent with competitors who may take advantage of your efforts after being primed with words associated with competence. Perhaps it is best not to discuss talents, success, and achievements with competitors, at least when facing social dilemmas or related situations of interdependence.

While the predicted 'harmful' effects of priming competence for competitors were observed in both studies, the predicted 'beneficial' effects for prosocials were not supported (Experiment 1) or only marginally supported (Experiment 2). In accounting for the lack of support in Experiment 1, we suggested a psychological ceiling effect, such that prosocials are unlikely to exhibit (much) greater cooperation than the interaction partner because of their concern with equality in outcomes and their fear of being exploited.

However, it is more important to note that competence primes did not result in decreased cooperation of prosocials. This is in contrast with the findings of Smeesters et al. (2003) who report reduced levels of cooperation for prosocials after a might prime. Of course, might is not exactly the same as competence. Might is a much broader concept, of which competence is just one aspect, next to power and potency. It is plausible that power and potency are closer related to exploitation than competence. Nevertheless, it is important to know that prosocials, at least in repeated interactions, do not at all associate competence with noncooperation.

We wish to outline another implication of the present findings. The findings suggest that, at least for priming competence, dispositional variables may not overshadow the effects of priming. That is, although the main effects of social value orientations were consistently observed, we did not obtain a pattern whereby the effects of priming disappeared because of these influences. Rather, the effects of priming may interact with dispositional variables in theoretically meaningful ways, such that priming affects only one group, or two groups in different directions (for related evidence, see Macrae &

Johnston, 1998). Such findings contribute to the new direction in priming research, seeking to illuminate the moderators of priming (Dijksterhuis & Bargh, 2001).

We should briefly comment on some strengths and limitations, and outline some avenues for future research. One strength, beyond those discussed earlier, is that we primed a concept that is viewed as being related to cooperation, but that is not directly logically or semantically associated with only cooperation or noncooperation. As such, along with other recent research (e.g. Mussweiler & Förster, 2000), the present research complements previous research that has tended to focus on conceptually closer associations, such as one of the first studies on priming in social dilemmas (i.e. priming of cooperation and competition, Hertel & Fiedler, 1998). The limitations of the present research derive from the fact that we used the same priming technique, as well as the same social dilemma task (though differing in the number of trials). Also, social value orientations were assessed during the same research session. However, previous research has demonstrated that a number of effects for social value orientations are observed, irrespective of whether these orientations are measured in the same research session (i.e. before a filler task) or a session held several weeks or months earlier (see Kuhlman, Camac, & Cunha, 1986; McClintock & Allison, 1989; Van Lange, 2000). Moreover, Utz et al. (S. Utz, P. A. M. Van Lange, E. Green, S. Waldzus, & I. Bovina, submitted; Mary honest always friendly and is: Can scrambled sentences enhance prosocial motivation?) found effects of morality primes on allocation behaviour in a study in which social value orientations were assessed about 6 weeks prior to the priming study. Thus, we are confident that similar results would be obtained if social value orientations were assessed a substantial time prior to the experimental session. Nevertheless, future research might address this question. Future research might also study the effects of even more subtle manipulations such as subliminal priming on cooperation in social dilemmas. Another open question is whether competence primes activate the dimension competence in general or the feeling of being competent. Future research should therefore contrast competence, incompetence, and neutral primes.

CONCLUDING REMARKS

Priming competence in social dilemmas can activate tendencies toward noncooperation and exploitation in those who associate competence with individual rationality (i.e. competitors). Moreover, the present research indicates that relatively subtle influences—that is concepts not directly related to cooperation and activated in a seemingly unrelated task—can ultimately shape patterns of interaction that are either very desirable or very undesirable from a collective point of view. Such evidence complements decades of research on social dilemmas, which has focused on explicit manipulations or mechanisms for promoting cooperation, such as incentive structure, group size, or possibilities for communication. As such the present research contributes to a recent emphasis on more subtle mechanisms, which may appear more potent than are often assumed. And, as alluded to earlier, one practical piece of advice that one may, at least for now, derive from the present findings seems similarly subtle: Do not activate concepts of competence when being interdependent with competitive individuals who are likely to associate being competent or 'smart' with exploitation rather than cooperation.

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APPENDIX

Dutch competence primes (prime words in italics)
ervaren zijn ze bergbeklimmers voorzichtig
speelzet *slim* iedere was deze
baas de *zakelijk* is brief
maken mensen profijt *ambitieuse* carriere
jongen is erg de *bekwaam*
getalenteerd is zij musicienne de
dieren *intelligente* dolfijnen zwemmen zijn
vrouwen zijn *slimme* zelfbewust succesvol
minder leren graag *begaafde* leerlingen
een antwoord wat verklaring *competent*

English translation of the priming sentences
experienced are they climbers cautious
move *clever* every was this
boss the *businesslike* is letter
make people profit *ambitious* carriere
boy is very the *capable*
she is *talented* the musician
animals *intelligent* dolphins swim are
women are *smart* self-confident successful
less learn (like to) *gifted* pupils
a answer what explanation *competent*

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